



Dart Aerospace Ltd.
1270 Aberdeen St
Hawkesbury, ON
K6A 1K7
Canada

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D407-667-105TRN
Job Sheet 196121



Part No: D407-667-105TRN

Job Qty: 1 pcs

Part Name: Crosstube Turning Detail



Part Weight: 0 lbs

Status: New

Priority: Medium

Job Created: 6/7/19

Job Tracking No:

Created By: Marie Lajeunesse

Due Date: 6/17/19

Description:

Note: DWG D407-667-145 REV.D IPP Rev:a 08.02.28 new issue EC IPP Rev B 08.04.02 Removed polish EC
verified by: DD

Ship Via:

Bill of Materials

Job Routing

Op No	Operation	Qty	Start Date	Due Date	Standard		Workcenter/Supplier		Lead Time	DAS Sign-off
					Setup Hrs	Run Hrs	Workcenter / Supplier			
100	Mori Selki TL-40 - 1	1 pcs	6/17/19	6/17/19	1.00	1.25	Mori Selki TL-40 - 1			662019/08/29 9-89
110	QC 2	1 pcs	6/17/19	6/17/19	0.00	0.00	QC 2 - 1			
							QC 2 - 12			
							QC 2 - 14			
							QC 2 - 17			
							QC 2 - 19			
							QC 2 - 2			
							QC 2 - 20			
							QC 2 - 22			
							QC 2 - 23			
							QC 2 - 25			
							QC 2 - 32			
							QC 2 - 33			
							QC 2 - 35			
							QC 2 - 39			
							QC 2 - 4			
							QC 2 - 40			
							QC 2 - 44			
							QC 2 - 45			
							QC 2 - 48			
							QC 2 - 49			
							QC 2 - 50			
							QC 2 - 51			
							QC 2 - 52			
							QC 2 - 57			
							QC 2 - 62			
							QC 2 - 63			
							QC 2 - 8			
							QC 2 - 66			
							QC 2 - 64			

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					QC 2 - 65	
					QC 2 - 5	
					QC 2 - 71	
					QC 2 - 73	
					QC 2 - 69	DAS
120	Mori Seiki TL-40 - 1 - B4B	1 pcs	6/17/19	1.00 1.12	Mori Seiki TL-40 - 1 - B4B	662019/09/04
130	QC 2	1 pcs	6/17/19	0.00 0.00	QC 2 - 1	9-89
					QC 2 - 12	
					QC 2 - 14	
					QC 2 - 17	
					QC 2 - 19	
					QC 2 - 2	
					QC 2 - 20	
					QC 2 - 22	
					QC 2 - 23	
					QC 2 - 25	
					QC 2 - 32	
					QC 2 - 33	
					QC 2 - 35	
					QC 2 - 39	
					QC 2 - 4	
					QC 2 - 40	
					QC 2 - 44	
					QC 2 - 45	
					QC 2 - 48	
					QC 2 - 49	
					QC 2 - 50	
					QC 2 - 51	
					QC 2 - 52	
					QC 2 - 57	
					QC 2 - 62	
					QC 2 - 63	
					QC 2 - 8	DAS
					QC 2 - 66	662019/09/04
					QC 2 - 64	9-89
					QC 2 - 65	
					QC 2 - 5	
					QC 2 - 71	
					QC 2 - 73	
					QC 2 - 69	
140	QC 8	1 pcs	6/17/19	0.00 0.00	QC 8 - 12	
					QC 8 - 14	
					QC 8 - 17	
					QC 8 - 20	
					QC 8 - 25	
					QC 8 - 3	
					QC 8 - 32	
					QC 8 - 33	
					QC 8 - 35	
					QC 8 - 39	
					QC 8 - 4	
					QC 8 - 44	
					QC 8 - 45	
					QC 8 - 49	
					QC 8 - 58	
					QC 8 - 8	
					QC 8 - 9	
					QC 8 - 68	
					QC 8 - 67	

6/7/2019

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					QC 8 - 1 (A)	
					QC 8 - 47	
					QC 8 - 40	
					QC 8 - 52	DAS
					QC 8 - 23	76
					QC 8 - 57	9-89
145 Crosstubes - 2 - B4B	1 pcs	6/17/19	0.00 0.36	Crosstubes - 1 - B4B		
				Crosstubes - 2 - B4B	BB	09/30/19
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
150 Crosstubes - 3 - B4B	1 pcs	6/17/19	0.00 0.40	Crosstubes - 1 - B4B	BB	9-10-26
				Crosstubes - 2 - B4B		
				Crosstubes - 3 - B4B		
				Crosstubes - 4 - B4B		
160 QC 7	1 pcs	6/17/19	0.00 0.00	QC 7 - 10		
				QC 7 - 13		
				QC 7 - 14		
				QC 7 - 15		
				QC 7 - 17		
				QC 7 - 18		
				QC 7 - 19		
				QC 7 - 2		
				QC 7 - 28		
				QC 7 - 3		
				QC 7 - 30		
				QC 7 - 34		
				QC 7 - 36		
				QC 7 - 37		
				QC 7 - 41		
				QC 7 - 47		
				QC 7 - 48		
				QC 7 - 51		
				QC 7 - 58		
				QC 7 - 59		
				QC 7 - 60		
				QC 7 - 9		
				QC 7 - 68		
				QC 7 - 50		
				QC 7 - 67		
				QC 7 - 40		
				QC 7 - 24		
				QC 7 - 43		
170 Packaging 3-1 - Stock - B4B	1 pcs	6/17/19	0.00 0.00	Packaging 3 - 1 - B4B		
				Packaging 3 - 2 - B4B		
				Packaging 3 - 3 - B4B		
				Packaging 3 - 4 - B4B		
				Packaging 3 - 5 - B4B		
				Packaging 3 - 6 - B4B		
				Packaging 3 - 7 - B4B		
				Packaging 3 - 8 - B4B		
				Packaging 3 - 9 - B4B		
				Packaging 3 - 10 - B4B		
				Packaging 3 - 11 - B4B		
				Packaging 3 - 12 - B4B		
				Packaging 3 - 13 - B4B		
				Packaging 3 - 14 - B4B		
				Packaging 3 - 15 - B4B		
				Packaging 3 - 16 - B4B		
				Packaging 3 - 17 - B4B		

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				Packaging 3 - 18 - B4B	
				Packaging 3 - 19 - B4B	
				Packaging 3 - 20 - B4B	
				Packaging 3 - 21 - B4B	
				Packaging 3 - 22 - B4B	
				Packaging 3 - 23 - B4B	
				Packaging 3 - 24 - B4B	2019-11-1
				Packaging 3 - 25 - B4B	
				Packaging 3 - 26 - B4B	
				Packaging 3 - 27 - B4B	
				Packaging 3 - 28 - B4B	
				Packaging 3 - 29 - B4B	
				Packaging 3 - 30 - B4B	
				Packaging 3 - 31 - B4B	
				Packaging 3 - 32 - B4B	
				Packaging 3 - 33 - B4B	
				Packaging 3 - 34 - B4B	
				Packaging 3 - 35 - B4B	
				Packaging 3 - 36 - B4B	
180 QC 21 - SA	1 pcs	6/17/19	0.00 0.00	QC 21 - SA - 21	DAS
				QC 21 - SA - 70	21
				QC 21 - SA - 53	8-35

Part Op 100 - 1- Fill tube with sand & install plugs 407-105 on both ends as per Folio FA249 2- Turn both side of tube 3- Turn first
 Descriptions: taper section on both side as per folio FA249
 110 - (QC2- Inspect parts off machine FAI/FAIB)
 120 - 1- Turn second taper on both side 4- Scribe part # and batch # using vibrating stylus on the cuff as per Dwg D407-667-145 5- Ultra sound the crosstube as per FAI. "wall thickness mesurment" at given location.
 130 - (QC2- Inspect parts off machine FAI/FAIB)
 140 - (QC8- Inspect parts - second check)
 145 - GRIND ONLY TRANSITION LINES SMOOTH LONGITUDE WAY.
 150 - 1- handfinish X-TUBE INSIDE AND OUT
 160 - (QC7-Inspect Chemical Conversion Coat)
 170 - (Identify as per dwg & Stock Location: _____) LOCATION : LG014
 180 - (QC21- Final Inspection - Work Order Release)

Job BOM				
Part / Item	Component Name	Quantity	Operation	Container
D6010-115	Crosstube Material	1 pcs (1 ea)	100-Mori Seiki TL-40 - 1	F123975

Job Allocations				
Operation	Component Part	Required	Inventory	Allocated
100-Mori Seiki TL-40 - 1	D6010-115	1	110	0

Part Specifications	
Specifications could not be found.	



Container No: S210282



Part: D407 - 667 - 105TRN

Job No: 196121

Serial No/Batch: S210282

Revision: D

Inspector:

Exp Date:

Instructions:

Dart Aerospace Ltd.
 1270 Aberdeen Street
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 CANADA
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 Email: sales@dartaero.com
 www.dartaerospace.com

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Date: 08/29/19

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DART AEROSPACE LTD	Work Order:	196121
Description: Crosstube Assembly	Part Number:	D407-667-145
Inspection Dwg: D407-667-145 Rev: D		Page 1 of 2

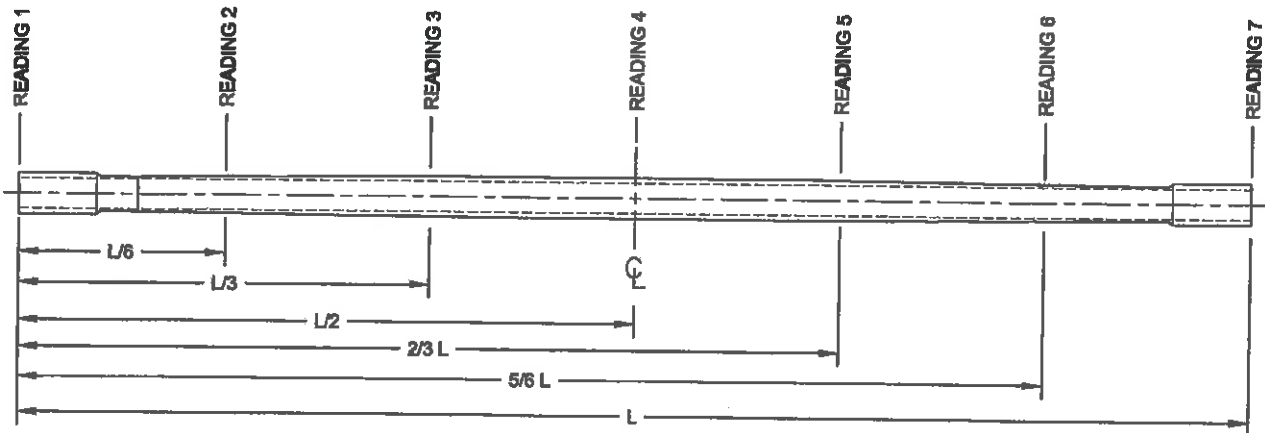
FIRST ARTICLE INSPECTION CHECKLIST

	Inspection Sheet Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
SIDE A	2.240	+0.005/-0.000	2.239		✓	cnc-04	undersize by .001 OK
	1.865	+0.005/-0.000	1.870	✓		cnc-08	
	1.878	+0.005/-0.000	1.883	✓			
	1.970	+0.005/-0.000	1.975	✓		↓	
	2.030	+0.005/-0.000	2.035	✓		cnc-04	
	2.165	+0.005/-0.000	2.170	✓		"	
	0.125	+/-0.010	.126	✓		cnc-08	
	R0.063	+/-0.010	.063	✓		RG	
	R0.500	+/-0.010	.500	✓		"	
	R0.063	+/-0.010	.063	✓		"	
	4.438	+/-0.030	4.441	✓		cnc-08	
SIDE B	2.240	+0.005/-0.000	2.241	✓		cnc-04	
	1.865	+0.005/-0.000	1.870	✓		cnc-08	
	1.878	+0.005/-0.000	1.883	✓		↓	
	1.970	+0.005/-0.000	1.975	✓			
	2.030	+0.005/-0.000	2.035	✓		cnc-04	
	2.165	+0.005/-0.000	2.170	✓		"	
	0.125	+/-0.010	.122	✓		cnc-08	
	R0.063	+/-0.010	.063	✓		RG	
	R0.500	+/-0.010	.500	✓		"	
	R0.063	+/-0.010	.063	✓		"	
	4.438	+/-0.030	4.440	✓		cnc-08	
	113.20	+/-0.020	113.21	✓		tape	

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DART AEROSPACE LTD	Work Order:	196121
Description: Crosstube Assembly	Part Number:	D407-667-145
Inspection Dwg: D407-667-145 Rev: D		Page 2 of 2

WALL THICKNESS MEASUREMENT



Location	WALL THICKNESS MEASUREMENT (IN)				Deviation Δw (max-min)	TOLERANCE
	w1	w2	w3	w4		
READING 1 L= 0"	.316	.310	.309	.311	.007	0.042"
READING 2 L= 18.867	.178	.169	.165	.171	.013	
READING 3 L= 37.734	.266	.262	.263	.270	.008	
READING 4 L= 56.700	.312	.306	.311	.328	.022	
READING 5 L= 75.467	.262	.256	.265	.275	.019	
READING 6 L= 94.333	.165	.163	.175	.178	.015	
READING 7 L= 113.20	.312	.309	.307	.311	.005	

Calibration Result

Actual Block Thickness: 100-500

Sitescan 250 Measured Thickness: 100-500

Measured by: DAS 66		Audited by:		Preliminary Approval:	
Date: 2019/09/04		Date:		Date:	
Rev	Date	Change	Revised by	Approved	
C	09.06.11	Dwg Rev updated	KJ		
D	11.06.21	Tolerance revised for 4.438 dimension	KJ		
E	12.06.04	Wall thickness form added	KJ		
F	19.03.27	Dwg Rev updated	MC		

Item	Qty -145	Part Number	Description
1	X	D407-867-145	CROSSTUBE ASSEMBLY (407 HIGH FWD)
2	1	D8010-115	CROSSTUBE
3	2	D2873-043	NUT PLATE
4	2	D2873-045	NUT PLATE
5	2	D2891-1	SUPPORT
6	4	D3585-063-385	RUBBER CUSHION
7	4	MS2192D-20	CLAMP (OR MS2192D-21)
8	14	MS20801AD4W10	RIVET (OR NAS9302B 4-10)
9	AIR	PROSEAL 880 B-2	SEALANT, AMS-S-8802 CLASS B-2
10	2	AN742D38	CLAMP
11	2	MS9185-05	ANGLE BRACKET
12	2	MS21042L3	NUT (OR MS21042-3)
13	2	MS2703B-1-08	SCREW
14	4	NAS1148C0332R	WASHER (OR AN1860CTOL)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D8010-115
- FINISH: FINISHED LENGTH = 113.20±0.020
CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D407-867-145" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: 17.8 lbs
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART WHERE INDICATED. BLEND OUT EDGE LONGITUDINALLY.
- TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 8 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 028.
- TO INSTALL D2891-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 880 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- INSTALL MS2192D-20 CLAMPS (OR -21) WITH D3585-063-385 RUBBER CUSHIONS TO SECURE THE D2891-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMP MECHANISMS ARE LOCATED ON CROSSTUBE SUPPORTS.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS ARE SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 880 SEALANT HAS CURED FOR 72 HOURS.
- MASK AREA UNDER CLAMP PRIOR TO PAINTING.
- SEAL EDGES WHERE AN742D38 CLAMP MEETS WITH THE CROSSTUBE USING SIKAFLEX-241/-251 OR MIL-S-8802 CLASS B2 OR PROSEAL 880 SEALANT.
- PERFORM RESISTANCE CHECK TO ENSURE MAX RESISTANCE IS 10 MILLIOHMS.

SHOP COPY
RETURN TO
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UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE

WORK ORDER
NO. 196121
MCS
19/06/07

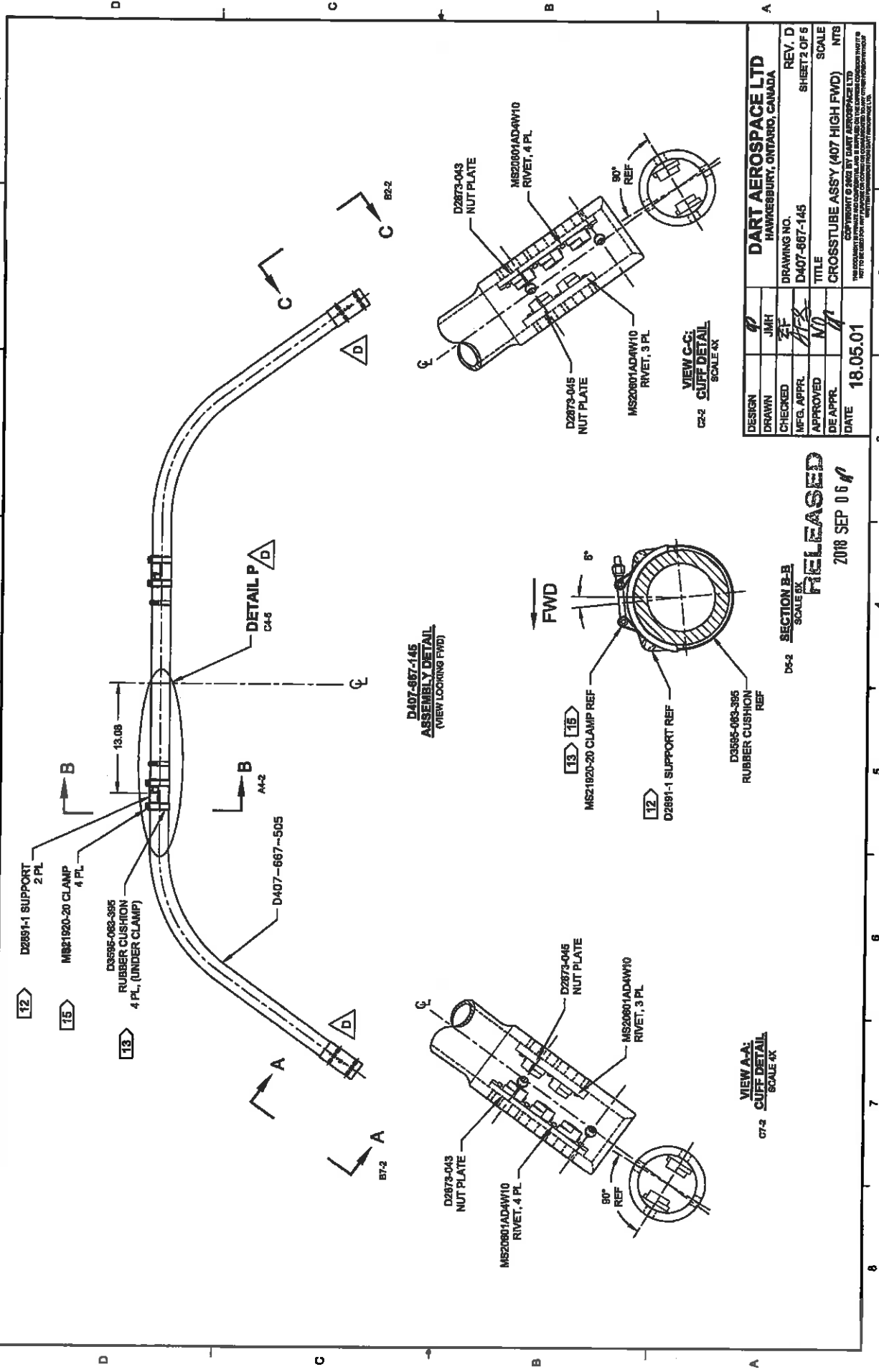
D	REVISE SHEET 2 ASSEMBLY DETAIL HOLE PATTERN PER CAR16-221. UPDATE PARTS LIST AND GENERAL NOTES 12 & 15 TO INCORPORATE DED C-1. ADD ITEMS 10-14 TO PARTS LIST. ADD GENERAL NOTES 18-18 AND ADD SHEET 5 TO INCORPORATE DED C-2.	JMH	18.05.01
C	REVISE GENERAL NOTES PART LIST (ZN D7-1); REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS. D3585-063-385 WAS D2891-100-684 (ZN D5-2 & A5-2); REMOVED REF. 7 ADD TOLERANCES (ZN C5-3, C4-3, C2-3); RELOCATED FLAG #6 (ZN A6-3) PER MCR 211; MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4.	RF	06.11.06
B	ADD HOLES AND NUT PLATES FOR COMPATIBILITY WITH BHTMA SKIDTUBES	PH	08.07.28
A	NEW ISSUE	CP	02.05.08
REV.	DESCRIPTION	BY	DATE
DESIGN	JMH		
DRAWN			
CHECKED	JMH		
MPG. APPR.	ZF	DRAWING NO.	REV. D
APPROVED	ZF	D407-867-145	SHEET 1 OF 5
DE APPR.	N0	TITLE	SCALE
DATE	18.05.01	CROSSTUBE ASSY (407 HIGH FWD)	NTS

RELEASED
2018 SEP 06
2018-07-17

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HAWKESBURY, ONTARIO, CANADA

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DESIGN	DATE	18.05.01	1
DRAWN	DATE	18.05.01	2
CHECKED	DATE	18.05.01	3
APPROVED	DATE	18.05.01	4
DE APPR	DATE	18.05.01	5
DATE	DATE	18.05.01	6
DESIGN	DATE	18.05.01	7
DRAWN	DATE	18.05.01	8
CHECKED	DATE	18.05.01	9
APPROVED	DATE	18.05.01	10
DE APPR	DATE	18.05.01	11
DATE	DATE	18.05.01	12

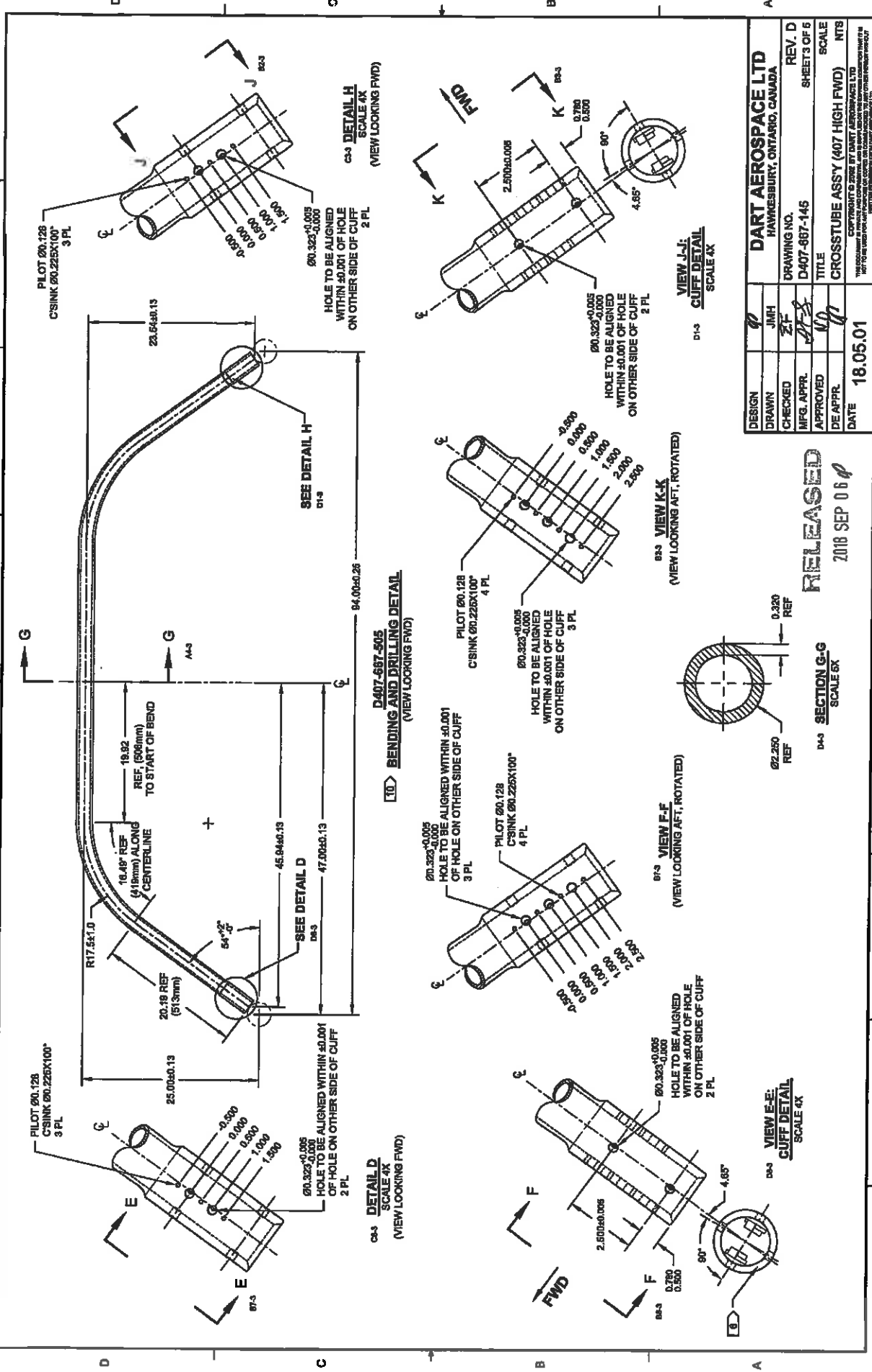
DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA
DRAWING NO. D407-667-145
REV. D
SHEET 2 OF 6
TITLE CROSS-TUBE ASSY (407 HIGH FWD)
NTS
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SECTION B-B
SCALE 6X
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2018 SEP 06

VIEW A-A:
CLIFF DETAIL
SCALE 4X

VIEW C-C:
CLIFF DETAIL
SCALE 4X

1 2 3 4 5 6 7 8



DESIGN	REV. D
DRAWN	JNH
CHECKED	ZF
MFG. APPR.	D407-687-145
APPROVED	U
DATE	18.05.01

TITLE	CROSSTUBE ASSY (407 HIGH FWD)
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RELEASED
2018 SEP 06

SECTION G-G
SCALE 4X

VIEW E-E:
CUFF DETAIL
SCALE 4X

VIEW F-F:
(VIEW LOOKING AFT, ROTATED)

VIEW G-G:
(VIEW LOOKING AFT, ROTATED)

VIEW H-H:
CUFF DETAIL
SCALE 4X

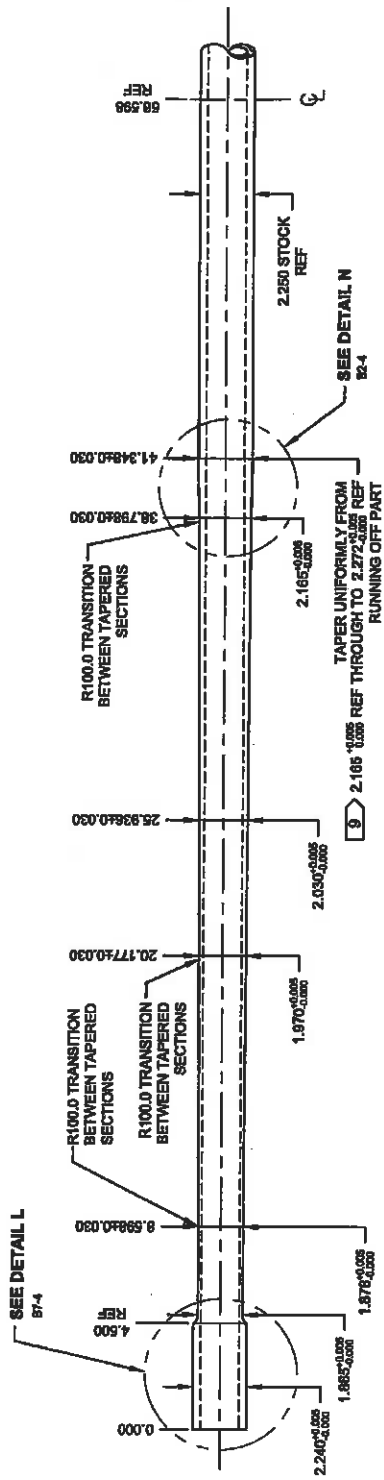
VIEW I-I:
CUFF DETAIL
SCALE 4X

VIEW J-J:
CUFF DETAIL
SCALE 4X

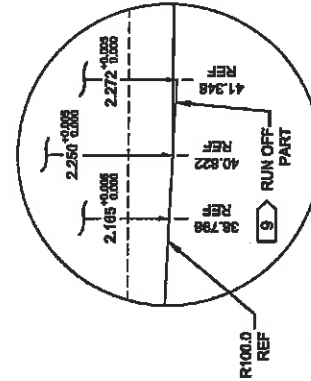
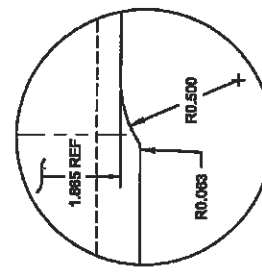
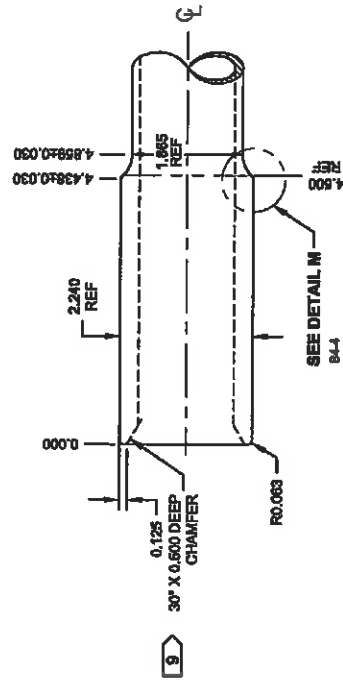
VIEW K-K:
(VIEW LOOKING AFT, ROTATED)

VIEW L-L:
CUFF DETAIL
SCALE 4X

1 2 3 4 5 6 7 8



TURNING DETAIL



DESIGN	00	DART AEROSPACE LTD
DRAWN	JMH	HAWKESBURY, ONTARIO, CANADA
CHECKED	ZF	DRAWING NO.
MFG. APPR.	87-8	D407-887-145
APPROVED	87-8	TITLE
DATE	18.05.01	CROSSTUBE ASSY (407 HIGH FWD)
SCALE		NTS
REV. D	SHEET 4 OF 6	REV. D

RELEASED
2018 SEP 06 04

1 2 3 4 5 6 7 8

8 7 6 5 4 3 2 1

AFT

AN742D38
CLAMP

MS27038-1-08
SCREW

NAS1148C0332R
WASHER

MS9185-05
ANGLE BRACKET

NAS1149C0332R WASHER
MS21042L3 NUT

D407-867-505 CROSSTUBE
REF

16
17
18

9.81

R

R

CROSSTUBE
C

D5-2 DETAIL P
BONDING STRAP INSTALLATION 2 PL

0.50
REF

R

R

C4-5 SECTION R-R



DESIGN	φ	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	JMH	
CHECKED	ZF	DRAWING NO.
MFG. APPR.	APR	D407-867-145
APPROVED	APR	TITLE
DE APPR.	φ	CROSSTUBE ASSY (407 HIGH FWD)
DATE	18.05.01	SCALE
		NTS

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2018 SEP 06 φ

REV. D
SHEETS 5 OF 8
SCALE
NTS
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8 7 6 5 4 3 2 1